

A Leading-Edge Hardware Family for LLRF and Diagnostics in CERN's Synchrotrons

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A leading-edge hardware family, evolution of that successfully deployed in CERN's Low-Energy Ion Ring (LEIR), is under development at CERN to address the low-level RF (LLRF) needs of synchrotrons in the Meyrin site. It will be deployed in 2014 in the CERN's PS Booster and in the medical machine MedAustron. It will be then retro-fit to the LEIR machine to standardise the LLRF implementation. It will also be used for the LLRF as well as longitudinal diagnostics implementation for the new Extra Low ENergy Antiproton (ELENA) Ring, a new synchrotron that will be commissioned in 2016 to further decelerate the antiprotons transferred from the CERN's Antiproton Decelerator (AD).

The requirements for the LLRF as well as for the diagnostics systems are very demanding owing to the revolution frequency swing, dynamic range and low noise required by the cavity voltage control and digital signal processing to be performed. This talk gives an overview of the main building blocks of the hardware family and of the associated firmware and IP cores.

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